

AKM Calibrations

NC License # 032-1057-1 Registration # S000454

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Calibration Report/Certification

REPORT# 114415

PREPARED FOR: Mazur Instruments

We certify that the following meter was calibrated on the indicated date using an NIST traceable radiation field source

Model Mazur PRM-9000
Detector 1 Internal Pancake GM
Detector 2 None
ID None

SN 92347

Date 8/23/2014

PO# Instrotek

Contact Vince Mazur

Calibrated By Robert D. Pearlstein

PRE-CALIBRATION CHECK

- Contamination No Yes; returned without calibration
- Batteries OK Replaced Used AC Power
- Audio OK Malfunction No Audio Function
- Detector OK Malfunction Repaired
- Cables OK Malfunction Repaired
- Switches OK Malfunction Repaired
- HV Circuit OK As Received Reset to 900V Repaired
- Pulse Detector OK Malfunction Repaired
- Electrometer OK Malfunction Repaired

CALIBRATION CONDITIONS

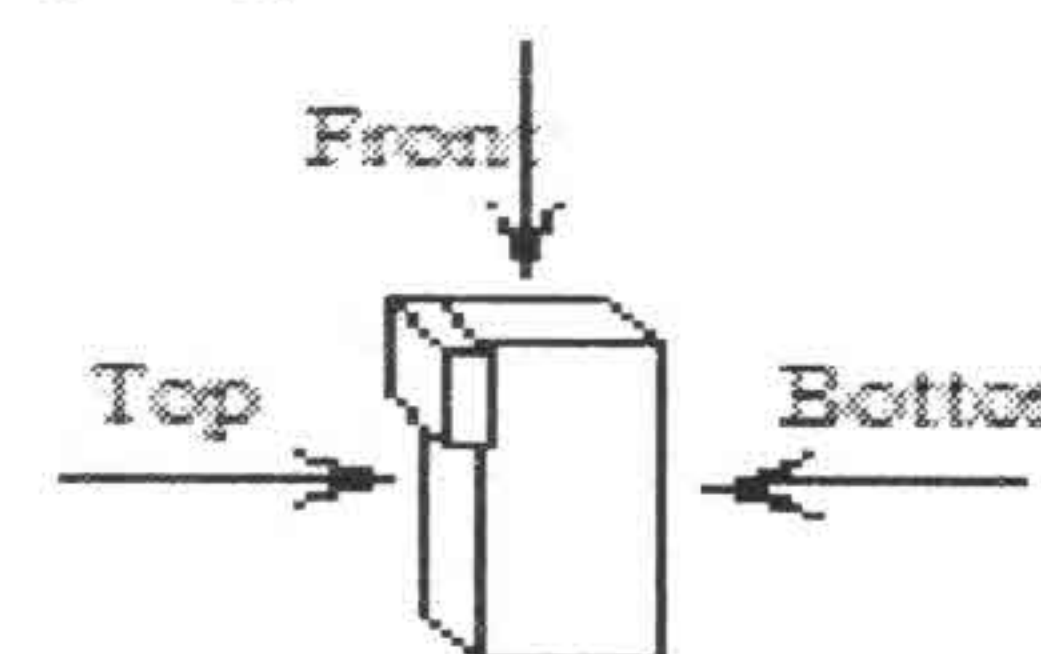
Temperature (°F) 74 Relative Humidity 66% Pressure (mmHg) 1008 mbar

Radiation Beam / Detector Alignment:

- normal to detector long axis normal to bottom surface
- parallel to detector long axis normal to front surface
- normal to detector window normal to side surface
- normal to top surface

Shield/Build-up Cap

- No shield Shield closed
- Shield open Build-up cap used



ACCURACY

Determined using a NIST Traceable Cs-137 source (collimated beam, gamma emission)

Scale: mR/hr

Range

0.5 to 100 Error ≤ 10%

Note: Detector response may vary with energy of the photon radiation. Consult manufacturer's technical sheet for details.

CALIBRATION SOURCES

137Cs Source #773555

Exposed through bottom (back) surface / mica window of internal detector.

CHECK SOURCE

None

PRECISION/CONSTANCY

Readout Stability (Relative Standard Deviation)	Repeated Measurements of Same Field			Test Result
	Obs 1	Obs 2	Obs 3	
2.6% @ 0.5 mR/hr	50 mR/hr	50 mR/hr	50 mR/hr	OK

RSD = StDev x 100 / Mean
of 5 to 10 observation made
at 3-5 second intervals.

Meter powered down and re-positioned in radiation field between each observation

ENERGY RESPONSE

Photons

Typical (from Manufacturer's Technical Specifications, not measured)

OBSERVATIONS / CALIBRATION FACTORS

Range	Scale	"True"*	As Found	As Returned	SEM**	CalFact***
0 to 1	mR/hr	0.5	0.467	0.467	0.004	1.07
1 to 10	mR/hr	2	1.93	1.93	0.03	1.04
1 to 10	mR/hr	5	4.89	4.89	0.05	1.02
10 to 100	mR/hr	20	19.8	19.8	0.1	1.01
10 to 100	mR/hr	50	49.3	49.3	0.3	1.01
100 to 1000	mR/hr	100	101	101	0.3	0.99
100 to 1000	mR/hr	500	>125	>125	ND	ND
100 to 1000	mR/hr	1000	>125	>125	ND	ND

* "True" Exposure Rate/Exposure values calculated from NIST traceable source calibration measurements after correcting for source decay, filtration, and source-detector distance (to center of detector).

** SEM = Standard Error of Mean, N = 5 to 10 Observations

*** CalFact = "True" / As Returned (Corrected = Indicated X CalFact)

NA = Not Applicable; ND = Not Determined; NL = Non-Linear; Over = OverRange; PPM = electronically generated pulses per minute (PPS = per second).

DETECTOR LINEARITY

Exposure Rate

- Linear over entire operating range Linear to at least 100 mR/hr

Count Rate (Radiation Response)

Linear to at least

Exposure Rate	Count Rate

COMMENTS

Meter calibrated for survey of photon radiation fields. Readings should be corrected for energy response if using for radionuclides other than Cs-137.

Reviewed by: _____

Robert D. Pearlstein Ph.D..

SUGGESTED RECALIBRATION DATE: August 23, 2015